



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

GA

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/730,046

12/09/2003

Junggyu Park

Q76054

3031

23373 7590 08/30/2006

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

KENDALL, CHUCK O

ART UNIT

PAPER NUMBER

2192

DATE MAILED: 08/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/730,046

Applicant(s)

PARK ET AL.

Examiner

Chuck O. Kendall

Art Unit

2192

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 09 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 01/06,03/05 & 08/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Detailed Action

1. This is in response to application filed 12/09/03.
2. Claims 1 – 15 have been examined.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 8 –15 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

No tangible result.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

6. Claims 1, 2, 7, 8, 10 – 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Kwong et al. US 6,484,188 B1.

Regarding claim 1, a system for shortening the compiling time of byte codes in a Java program, comprising:

- a class loader unit for loading byte codes generated by compiling Java program source codes (Fig. 1, 130);

- a first memory unit for maintaining the byte codes loaded by the class loader unit and native codes generated by compiling the byte codes in an accessible state (3:1 – 4, see Java Virtual machine and various memory areas);

- a second memory unit for storing the native codes that are loaded into the first memory unit in the accessible state(3:1 – 4, see Java Virtual machine and various memory areas);

- a native code manager unit for searching the native codes stored in the second memory unit and loading requested native codes into the first memory unit according to a request by a class loader unit (6: 20 – 30, see java class file manager); and

- an execution unit for executing the native codes that are loaded into the first memory unit in the accessible state.

Regarding claim 2, the system as claimed in claim 1, further comprising a garbage collector unit for automatically collecting space occupied by unused codes in the first memory unit (4:1 – 5).

Regarding claim 7, the system as claimed in the claim 1, wherein the execution unit comprises:

a byte code interpreter for interpreting the byte codes, which are loaded into the first memory unit in the accessible state, to be executed (Fig. 1, interpreter);

a runtime profiler for checking whether the byte codes being interpreted by the byte code interpreter are frequently used byte codes (4:20 – 25); and

a native code compiler for compiling the checked byte codes to native codes if the checked byte codes are determined as the frequently used byte codes by the runtime profiler (FIG. 1, compiler).

Regarding claim 8, the method version of claim 1, see rationale above as previously discussed.

Regarding claim 10, the method as claimed in claim 8, further comprising the steps of, if it is determined from the search results that there are no corresponding native codes in the second memory unit:

(a6) transmitting the byte codes loaded by the class loader unit to the first memory unit (FIG. 2, 130);

and

(a7) interpreting and executing the byte codes transmitted to the first memory unit by a byte code interpreter (FIG. 2, 121).

Regarding claim 11, the method as claimed in claim 10, wherein step (a7) comprises the step of checking, by a runtime profiler, whether the byte codes being interpreted by the byte code interpreter are frequently used byte codes (4:20 – 25, see profiling).

Regarding claim 12, the method as claimed in claim 11, further comprising the steps of, if the byte codes are identified as frequently used byte codes from the check results:

(a8) generating, by a native code compiler, native codes corresponding to the frequently used byte codes by compiling the byte codes interpreted by the byte code interpreter (FIG. 2, see jit compiler);

(a9) loading the generated native codes into the first memory unit (3:1 – 20); and

(a10) storing the loaded native codes in the second memory unit by the native code manager unit (3:1 – 20).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3, 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwong et al. US 6,484,188 B1 as applied in claim 2, in view of Benson et al. USPN 6,421,689 B1.

Regarding claim 3, Kwong discloses all the claimed limitations as applied in claim 2 above. Kwong doesn't explicitly disclose wherein the garbage collector unit requests the native code manager unit to store the native codes, which have been loaded into the first memory unit, in the second memory unit if a space shortage occurs in the first memory unit. However, Benson in an analogous art and similar configuration discloses in response to detecting insufficient amount of memory in the second memory area, moving referenced objects to a first memory location (16:50 – 55). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Kwong and Benson, because it would make the memory more manageable.

Regarding claim 4, Benson further discloses the system as claimed in claim 1, wherein the native code manager unit stores the native codes, which have been loaded into the first memory unit, in the second memory unit (Benson, 9:25 – 30, see copy of the object).

Regarding claim 13, the method as claimed in claim 8, wherein the native codes loaded into the first memory unit are stored in the second memory unit if the execution

of the Java program is terminated or a space shortage occurs in the first memory unit (Benson, 16:50 – 55).

9. Claims 5, 6, 9, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwong et al. US 6,484,188 B1 as applied in claim 1, in view of Traversat et al. USPN 6,854,115.

Regarding claims 5 and 9, Kwong discloses all the claimed limitations as applied in claim 1 above. Kwong doesn't expressly disclose wherein the native code manager unit employs an LRU (least recently used) method to manage the native codes stored in the second memory unit.

However, Traversat in an analogous art and similar configuration discloses utilizing a garbage collection mechanism and a standard LRU (Least Recently Used) method for selecting pages for eviction (page out), (22:20 – 25). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Kwong and Traversat because, it would enable managing the memory to free up space.

Regarding claim 6, the system as claimed in claim 4, wherein the native code manager unit employs an LRU (least recently used) method to manage the native codes stored in the second memory unit (Traversat, 22:20 – 25).

Regarding claim 14, the method as claimed in claim 10, wherein the native codes stored in the second memory unit are managed by the native code manager unit

according to an LRU (least recently used) method (Traversatm, 22:20 – 25).

Regarding claim 15, the method as claimed in claim 13, wherein the native codes stored in the second memory unit are managed by the native code manager unit according to an LRU (least recently used) method (Traversatm, 22:20 – 25).

Correspondence information

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuck Kendall whose telephone number is 571-272-3698. The examiner can normally be reached on 10:00 am - 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Dam can be reached on 571-272-3695. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chuck Kendall 8/21/06